

WHAT IS CLAIMED IS:

1. In a wireless communication system, a method of receiving a stream of
2 information bytes comprising the steps of:
- 3 a) choosing one sequence number bit size from a predetermined set of
 - 4 sequence number bit sizes, wherein said step of choosing is based on sequence
 - 5 number values received in previous received frames;
 - 6 b) specifying said one sequence number size to be used in associated
 - 7 retransmissions in forming a negative acknowledgment (NAK); and
 - 8 c) sending said NAK to a data sender.
2. The method of claim 1 wherein the size of said predetermined set is two.
3. The method of claim 2 wherein the values in said predetermined set are
2 eight bits and twelve bits.
4. The method of claim 2 wherein values in said predetermined set are
2 eight bits and fourteen bits.
5. The method of claim 1 wherein the size of said predetermined set is
2 three.
6. The method of claim 2 wherein said step of specifying consists of
2 assigning a predetermined value to one bit in said NAK.
7. The method of claim 2 wherein said step of specifying comprises
2 assigning a predetermined value to one bit in said NAK.
8. The method of claim 1 wherein said step of choosing further comprises
2 the sub-steps of:
- 3 a.1) comparing a sequence number $V(N)$ belonging to a data receiver
 - 4 to a sequence number $V(R)$ belonging to said data receiver; and
 - 5 a.2) choosing said one sequence number bit size based on comparing
 - 6 the size of the sequence number space between said $V(N)$ and said $V(R)$ to one
 - 7 or more predetermined sequence number space sizes.
9. The method of claim 1 wherein said step of choosing further comprises
2 the sub-steps of:

4 a.1) comparing a sequence number $V(N)$ belonging to a data receiver
to a sequence number $V(R)$ belonging to said data receiver; and

6 a.2) choosing said one sequence number bit size based on whether
said $V(R)$ is greater than said $V(N)$ by more than a predetermined window size.

10. The method of claim 9 wherein said predetermined window size is 255.

2 11. The method of claim 1 wherein said step of choosing further comprises
the sub-steps of:

4 a.1) performing evaluation of a hole list based on a shortened
sequence number generated from a first full sequence number; and

6 a.2) choosing said one sequence number bit size based on the presence
of a match between said first full sequence number and at least one additional
full sequence number in said hole list.

12. The method of claim 11 further comprising the steps of:

2 d) receiving one or more retransmission frames, each having a
shortened sequence number; and

4 e) identifying the full sequence number of each of said one or more
retransmission frames based on said hole list and the contents of previously-
6 sent NAK frames.

13. The method of claim 9 wherein said predetermined window size is 255.

2 14. In a wireless communication system, a method of sending a stream of
information bytes comprising the steps of:

a) receiving a negative acknowledgment (NAK);

4 b) extracting one sequence number bit size from said NAK, said one
sequence number bit size belonging to a predetermined set of sequence number
6 bit sizes; and

8 c) sending a retransmit frame comprising a sequence number having a
number of bits equal to said one sequence number bit size.

2 15. The method of claim 14 wherein the size of said predetermined set is
three.

2 16. The method of claim 14 wherein the size of said predetermined set is
two.

17. The method of claim 16 wherein the values in said predetermined set are
2 eight bits and twelve bits.

18. The method of claim 16 wherein values in said predetermined set are
2 eight bits and fourteen bits.

19. The method of claim 16 wherein said step of extracting consists of
2 evaluating one bit in said NAK.

20. In a wireless communication system, a method of sending a stream of
2 information bytes comprising the steps of:

a) choosing one sequence number bit size from a predetermined set of
4 sequence number bit sizes; and

b) sending a new-data frame comprising a sequence number having a
6 number of bits equal to said one sequence number bit size.

21. The method of claim 20 wherein the size of said predetermined set is
2 three.

22. The method of claim 20 wherein the size of said predetermined set is
2 two.

23. The method of claim 21 wherein the values in said predetermined set are
2 eight bits and twelve bits.

24. The method of claim 21 wherein the values in said predetermined set are
2 eight bits and fourteen bits.

25. The method of claim 20, wherein said step of choosing further comprises
2 the sub-steps of:

a.1) advancing a radio link protocol (RLP) sequence number V(R)
4 belonging to a data receiver by a predetermined value to form an advanced
V(R);

a.2) performing comparison of an RLP sequence number V(S)
6 belonging to a data sender to said advanced V(R); and

a.3) choosing said one sequence number bit size based on said
8 comparison.

26. In a wireless communication system, a method of receiving a stream of
2 information bytes comprising the steps of:

4 a) choosing an acknowledgment frame type from a plurality of radio
link protocol (RLP) frame types; and

6 b) sending an acknowledgment frame (ACK) having said
acknowledgment frame type.

27. The method of claim 26 wherein said ACK comprises the RLP sequence
2 number value $V(R)$ of the data receiver sending the ACK.

28. The method of claim 27 wherein said ACK further comprises the RLP
2 sequence number values $V(N)$ and $V(S)$ of the data receiver sending the ACK.

29. The method of claim 26 wherein said step of choosing is based on the
2 receipt of a new-data frame from a data sender, said new-data frame
comprising a full-sized RLP sequence number.

30. The method of claim 26 wherein said step of choosing further comprises
2 the sub-steps of:

4 a.1) sending a prior RLP ACK comprising an RLP sequence number
 $V(R)$ to a data sender;

6 a.2) advancing said RLP sequence number $V(R)$ by a predetermined
sequence number window size to produce an advanced $V(R)$;

8 a.3) receiving an RLP new-data frame from said data sender having an
RLP sequence number $V(S)$; and

10 a.4) choosing said acknowledgment frame type based on whether said
 $V(S)$ is more advanced than said advanced $V(R)$.

31. The method of claim 30 wherein said predetermined sequence number
2 window size is 128.

32. The method of claim 26 wherein said step of choosing is based on
2 comparing the number of consecutive previous frames sent by the data receiver
not comprising an ACK frame to a predetermined threshold.